Bayesian factor analysis – abstract

Factor analysis is a method which enables high-dimensional random vector of measurements to be approximated by linear combinations of much lower number of hidden factors. Classical estimation procedure of this model lies on the choice of the number of factors, the decomposition of variance matrix while keeping identification conditions satisfied and on the appropriate choice of rotation for better interpretation of the model. This model will be transferred into bayesian framework which offers the usage of prior information unlike the classical approach. The number of hidden factors can be considered as a random parameter and the dependency of each measurement on at most one factor can be forced by suitable specification of prior distribution. Estimates of model parameters are based on posterior distribution which is approximated by Monte Carlo Markov Chain methods. Bayesian approach solves the problem of selection of the number of factors, the model estimation and the ensuring of the identifiability and the interpretability at the same time. The ability to estimate the real number of hidden factors is tested in a simulation study.